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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/899,183 | 07/06/2001 | Shigeru Matsuno | 401278 | 3158 |
| 23548 | 7590 | 04/08/2004 | EXAMINER | |
| LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960 | | | BUEKER, RICHARD R | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1763 | |

DATE MAILED: 04/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/899,183

Applicant(s)

YAMAMUKA ET AL.

Examiner

Richard Bueker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claims 14-18 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,273,957. Although the conflicting claims are not identical, they are not patentably distinct from each other because only minor and obvious differences exist. Claims 15-18 are broader than or generic to claims 10 and 17 of the patent, without the recitation of a vacuum region, and claim 14 is a minor variation of claim 6 of the patent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li (5,835,677) taken in view of Zhao (6,210,485). Li (Fig. 1) discloses a CVD apparatus having a CVD reaction chamber connected to a vaporizer for vaporizing CVD source materials. The vaporizer (Fig. 2) includes a heated chamber having an inlet and a heat conductive chamber wall that houses the baffles 52, 54 and 56. A spray nozzle 24 is located to spray CVD precursor source materials into the chamber through the inlet, and a plate contacting and locating the tip end of the nozzle (see the baffle plate for distributing inert gas illustrated in Fig. 2 but unlabeled). It is noted that "locate" is defined as "to determine or indicate the place, site or limits of", and the plate of Li indicates the place, site or limits of the nozzle. Cooling jacket 26 is a cooling block that is provided for cooling the nozzle (see col. 8, lines 14-17), and is thus in thermal contact with the nozzle. Fig. 2 of Li also illustrates a middle portion (where thermocouple 32 is

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located) that is positioned between and connects the lower heated portion of Li's vaporizer with the cooled upper portion of the vaporizer. Li does not disclose the middle portion as designed or intended to act as a heat conduction restricting region, and in view of the schematic nature of patent drawings it is not clear from Li's Fig. 2 that the middle portion is a heat conduction restricting region. Zhao (Figs. 4 and 5) also discloses a vaporizer having a lower heated vaporization chamber and an upper cooled liquid delivery section. Zhao teaches (col. 7, lines 34-45, and col. 9, lines 29-35) that a middle 'neck' portion located between and connecting the heated lower portion and cooled upper portion should be narrow to act as a heat conduction restricting region. Both the neck and the space around the neck act as a heat conduction restricting region. In view of the teachings of Zhao, it would have been obvious to one skilled in the art to intentionally design the middle portion of Li's vaporizer to be narrow enough to act as a heat conduction restricting region.

Alternatively, atomizer housing 12 of Li can be considered a cooling block that is in physical contact with the nozzle, because housing 12 is cooled by the cooling jacket 26, and the portion of Li's apparatus including the cooling jacket and narrow middle portion can be considered a plate having at least one portion (the narrow middle portion) that is thinner than the heated chamber wall of the lower vaporizing chamber. In this case, the space around the middle portion can be considered to be a heat conduction restricting region as recited in claims 15 and 17. Also, if for argument's sake, the cooling jacket and narrow middle portion of Li were not considered a plate, it

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would have at least been obvious to form them as a plate, in view of Zhao's design (Figs. 4 and 5) having an elongated cooling jacket 104 in the shape of a plate.

Claims 14, 16 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li taken in view of Zhao and Onabe (JP 09-143738). Li discloses the use of an ultrasonic nozzle to spray his liquid material to be vaporized, and he does not discuss the use of a nozzle having first and second coaxial tubes as claimed in claims 14, 16 and 18. Onabe (Figs. 1 and 2), however, teaches that a source material can be atomized and sprayed by a nozzle having first and second coaxial tubes. Also, Zhao teaches the use of two coaxial tubes for spraying a source material. It would have been obvious to one skilled in the art to modify the apparatus of Li by substituting a spray nozzle having first and second coaxial tubes of the type taught by Zhao and Onabe for the ultrasonic spray nozzle of Li because they teach that such a coaxial spray nozzle is an alternate and successful way of spraying source materials into a vaporizer.

Applicants have argued that both Li and Zhao lack any element corresponding to the heat conduction restricting means of the invention that forms an airtight seal between the spray nozzle and the chamber, which is recited in claim 14. It is noted, however, that Li's apparatus includes a middle portion (where thermocouple 32 is located) that forms an airtight seal with the heated chamber wall (that houses baffles 52, 54 and 56) of the vaporization chamber. This middle portion is disposed between the vaporization chamber and the end of the spray nozzle. As noted in the previous office action, the teachings of Zhao provide sufficient motivation to make it obvious to one

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skilled in the art to modify the middle portion of Li's apparatus to make at least part of it thin enough to restrict heat conduction in the desirable manner taught by Zhao.

Regarding claims 15 and 17, applicants have argued that the cooling jacket 26 of Li is not in direct contact with Li's nozzle 24. It is noted, however, that claims 15 and 17 do not recite that the cooling block is in direct physical contact as argued by applicants. As indicated in the rejection, the cooling jacket of Li is in thermal contact with the nozzle, in the sense that heat will be radiated from a warmer body, such as nozzle 24, across an open space to a cooler body, such as cooling jacket 26. It is noted that the word "contact" has a broader meaning than direct physical contact.

An English translation of Onabe (JP 9-143738) is attached to this office action.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (703) 308-1895. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Richard Bueker

Richard Bueker
Primary Examiner
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